

### REMARKS

Entry of the foregoing, re-examination and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.116, and in light of the remarks which follow, are respectfully requested.

Claims 5 and 13 have been canceled without prejudice or disclaimer. Claims 1, 20 and 22 have been amended in response to issues raised in the Office Action. Claims 1-3, 7-12 and 16-22 are now pending in this application.

Claim 13 was rejected under 35 U.S.C. §112, second paragraph, as being indefinite for the reasons set forth in paragraph (1) of the Office Action. This rejection is moot in light of the cancellation of claim 13.

Claims 1-3, 5, 7-13 and 16-22 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description for the reasons set forth in paragraphs (2), (3), (4), and (5) of the Official Action. Reconsideration and withdrawal of these rejections are respectfully requested for at least the following reasons.

The weight percent of the solvent was set forth in originally filed claim 14 and, thus, is part of the original disclosure. Applicants submit that the basis would be clear to those of ordinary skill in view of the information set forth in the working Examples.

Concerning the issue raised in paragraph (3) of the Office Action, a person of ordinary skill in the relevant art, i.e., the field of shape-memory polyurethanes, would readily comprehend the meaning and scope of the terms "tensile modulus" and "melting point" as used in the present specification. The previously-submitted article by Lendlein and Kelch ("Shape-Memory Polymers") supports Applicants' position that the terminology used in the specification is conventional in this art. Specifications do not have to describe in detail what is well-known in the art.

Concerning paragraph (4) of the Office Action, this rejection appears to be germane only to claims 20 and 22 which specify a range of about -30°C to about 80°C. In response, these claims have been currently amended to delete the words "or melting" such that the range only refers to a glass transition temperature.

Concerning the issue raised in paragraph (5), the passage specifically referred to by the Examiner on page 6 relates to a preferred embodiment of the invention. Page 4, lines 25-31 of the specification describes the generic concept of the invention:

"...this invention uses a difunctional isocyanate, a difunctional alcohol and a chain extender containing reactive hydrogen group, followed by neutralization. In this context, the term "active hydrogen group" refers to substituent groups having a relatively acidic hydrogen like carboxylic groups, hydroxyl groups, phenolic groups, and so on. Because of this, in the present invention, it is possible to obtain aqueous shape memory polyurethane..."

Clearly, the generic concept includes a chain extender with active hydrogen groups, and a neutralizer to capture the reactive hydrogen groups (note page 3, lines 25-26 of the specification). The use of a chain extender containing carboxyl groups is a preferred embodiment only.

Concerning the enablement issue raised in the first paragraph on page 5 of the Office Action, Applicants refer to the working Examples on pages 7 and 8 of the specification which disclose specific details to enable those skilled in the art to prepare shape memory polyurethanes in accordance with the present invention. Attached to the present Amendment is an envelope containing a sample manufactured in accordance with the present invention (labelled as "SMPU with DMPA(i) IP-102A") and a sample as described in U.S. Patent No. 5,270,433 (labelled with "PU from US5270433"). The sample of the present invention can be elongated after placement in hot water and retains its shape after cooling. The sample goes back to its original shape after

being re-immersed in hot water. These shape-memory properties of the claimed polyurethanes are absent from the sample prepared in accordance with the '433 reference.

In view of the above, the §112, first paragraph rejections have been obviated and should be withdrawn.

Claims 1-3, 5, 7-12 and 16-22 were finally rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 6,239,213 (Ramanathan et al) for the reasons set forth in paragraphs (7) and (8) of the Office Action. Claims 1-3, 5, 7-13 and 16-22 were also finally rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,270,433 (Klauck et al) for the reasons set forth in paragraphs (9) and (10) of the Official Action. Reconsideration and withdrawal of these rejections are requested in view of the above amendments and for at least the following reasons.

Ramanathan et al '213 is directed to the preparation of polyurethane aqueous dispersions. A polyester polyol is reacted with a compound containing an ionizable group, specifically an organic compound containing at least one active hydrogen, followed by the addition of a polyisocyanate to form a polyurethane prepolymer containing ionizable groups which provide improved water-dispersibility. In contrast, the presently claimed process reacts a difunctional alcohol with a difunctional isocyanate, then adds a chain extender to the reaction mixture. This distinction leads to different products.

The Office Action refers to column 5, lines 14-16, of this document. Sequential reaction refers to block copolymerization and does not suggest that the isocyanate can be reacted before reaction with the ionizable-group containing compound. The working Examples and claims of this reference are all directed to reaction between polyol and ionizable compound before reaction with polyisocyanate.

Klauck et al '433 requires the use of tetramethyl xylene diisocyanate. This component, which has been characterized in the Office Action as an aliphatic diisocyanate, is now excluded

from the present claims. Furthermore, the present invention is directed to the synthesis of shape-memory polyurethane dispersions, which have significantly different physical properties than the polyurethanes of Klauck et al '433 which do not have shape-memory properties. This conclusion is supported by the aforementioned samples which clearly show the differences between the properties of the claimed polyurethanes and the polyurethanes of the reference.

In view of the above, the §102(b) rejections over Ramanathan et al '213 and Klauck et al '433 should be reconsidered and withdrawn. Such action is earnestly solicited.

The issue raised in paragraph (10) of the Office Action has been rendered moot by the present amendments.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at (703) 838-6683 at his earliest convenience.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: September 18, 2006

By: 

George F. Lesmes  
Registration No. 19,995

P.O. Box 1404  
Alexandria, Virginia 22313-1404  
(703) 836-6620